

Exercise 12 – Hoosic River – Shifting Controls

- Using the measurements shown in the table below, and the rating table, rating curve, and rectangular-grid paper for the Hoosic River on the following pages, develop shift-by-stage V diagram(s) for measurement nos. 774-786. A blank table is included to help you compute the shift associated with each measurement.

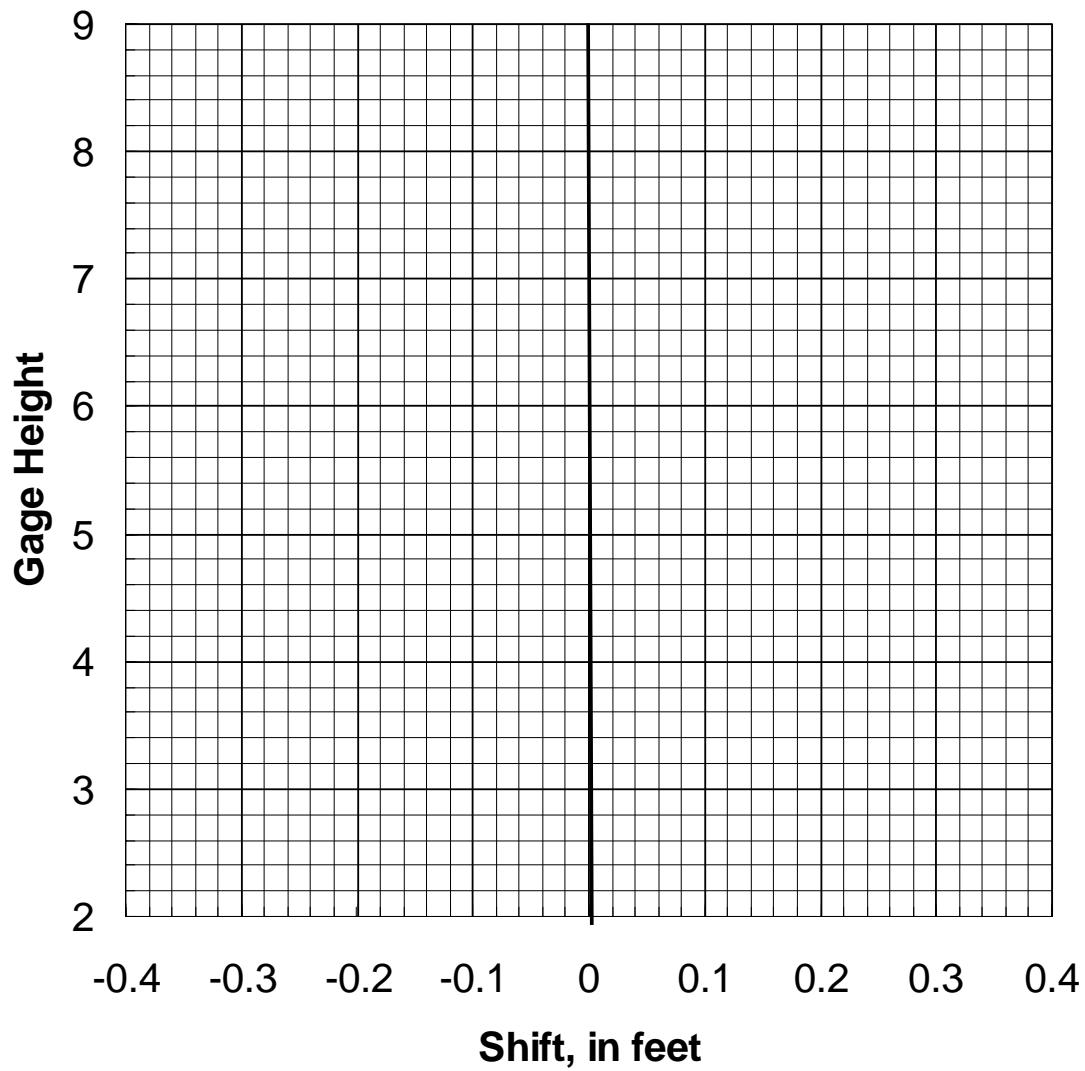
Measurement information

| No. | Date | G.H. | Discharge | Meas. rated |
|-----|----------|------|-----------|-------------|
| 774 | 8-19-87 | 3.82 | 859 | G |
| | | | | |
| 775 | 10-6-87 | 3.49 | 614 | G |
| 776 | 11-12-87 | 7.77 | 5490 | F |
| 777 | 12-21-87 | 3.61 | 702 | G |
| 778 | 12-29-87 | 4.24 | 1160 | G |
| 779 | 2-2-88 | 2.70 | 229 | G |
| 780 | 3-14-88 | 3.20 | 449 | G |
| 781 | 3-23-88 | 3.19 | 441 | G |
| 782 | 5-5-88 | 2.66 | 208 | G |
| 783 | 6-20-88 | 4.48 | 1350 | G |
| 784 | 7-21-88 | 5.70 | 2570 | F |
| 785 | 9-8-88 | 5.04 | 1840 | G |
| | | | | |
| 786 | 10-18-88 | 3.02 | 365 | G |

Shift computations

| G.H. | Measured discharge | Rating discharge | % diff (error in measured Q) | Rating GH for measured discharge | Shift indicated by measurement |
|------|--------------------|------------------|---------------------------------|----------------------------------|--------------------------------|
| 774 | 859 | | | | |
| | | | | | |
| 775 | 614 | | | | |
| 776 | 5490 | | | | |
| 777 | 702 | | | | |
| 778 | 1160 | | | | |
| 779 | 229 | | | | |
| 780 | 449 | | | | |
| 781 | 441 | | | | |
| 782 | 208 | | | | |
| 783 | 1350 | | | | |
| 784 | 2570 | | | | |
| 785 | 1840 | | | | |
| | | | | | |
| 786 | 365 | | | | |

Variable shift diagram



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

PAGE 1

EXPANDED RATING TABLE

DATE PROCESSED: 02-05-1988 @ 12:51 BY GHEBERT

TYPE: LOG

81534500

HOOSIC RIVER NEAR EAGLE BRIDGE NY
OFFSET: (2.70, 1.60)DD: 2 TYPE: 001 RATING NO: 58.U
START DATE/TIME: 01-26-86 (1030)BASED ON ----- DISCHARGE MEASUREMENTS, NOS ----- AND -----, AND IS ----- WELL DEFINED BETWEEN ----- AND ----- CFS
COMP BY ----- DATE ----- CHK. BY ----- DATE -----

| GAGE HEIGHT (FEET) | DISCHARGE IN CUBIC FEET PER SECOND | | | | | | (EXPANDED PRECISION) | | | DIFF IN C PER TENTH FT | | |
|--------------------------|------------------------------------|-------|-------|-------|-------|-------|----------------------|-------|-------|------------------------------|-------|--|
| | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 | | |
| 2.70 | 175.0* | 178.2 | 181.4 | 184.7 | 188.0 | 191.3 | 194.6 | 198.0 | 201.4 | 204.8 | 33.30 | |
| 2.80 | 208.3 | 211.8 | 215.3 | 218.8 | 222.4 | 226.0 | 229.6 | 233.3 | 237.0 | 240.7 | 36.20 | |
| 2.90 | 244.5 | 248.2 | 252.0 | 255.9 | 259.7 | 263.6 | 267.5 | 271.5 | 275.5 | 279.5 | 39.00 | |
| 3.00 | 283.5 | 287.6 | 291.7 | 295.8 | 300.0 | 304.1 | 308.4 | 312.6 | 316.9 | 321.2 | 42.00 | |
| 3.10 | 325.5 | 329.8 | 334.2 | 338.6 | 343.1 | 347.6 | 352.1 | 356.6 | 361.1 | 365.7 | 44.90 | |
| 3.20 | 370.4 | 375.0 | 379.7 | 384.4 | 389.1 | 393.9 | 398.7 | 403.5 | 408.3 | 413.2 | 47.70 | |
| 3.30 | 418.1 | 423.0 | 428.0 | 433.0 | 438.0 | 443.1 | 448.2 | 453.3 | 458.4 | 463.6 | 50.70 | |
| 3.40 | 468.8 | 474.0 | 479.2 | 484.5 | 489.8 | 495.2 | 500.6 | 505.9 | 511.4 | 516.8 | 53.50 | |
| 3.50 | 522.3 | 527.8 | 533.4 | 539.0 | 544.6 | 550.2 | 555.8 | 561.5 | 567.2 | 573.0 | 56.50 | |
| 3.60 | 578.8 | 584.6 | 590.4 | 596.3 | 602.2 | 608.1 | 614.0 | 620.0 | 626.0 | 632.1 | 59.30 | |
| 3.70 | 638.1 | 644.2 | 650.3 | 656.5 | 662.7 | 668.9 | 675.1 | 681.4 | 687.7 | 694.0 | 62.30 | |
| 3.80 | 700.4 | 706.7 | 713.2 | 719.6 | 726.1 | 732.6 | 739.1 | 745.7 | 752.2 | 758.9 | 65.10 | |
| 3.90 | 765.5 | 772.2 | 778.9 | 785.6 | 792.4 | 799.2 | 806.0 | 812.8 | 819.7 | 826.6 | 68.00 | |
| 4.00 | 833.5 | 840.5 | 847.5 | 854.5 | 861.6 | 868.6 | 875.8 | 882.9 | 890.1 | 897.3 | 71.00 | |
| 4.10 | 904.5 | 911.7 | 919.0 | 926.3 | 933.7 | 941.0 | 948.4 | 955.9 | 963.3 | 970.8 | 73.80 | |
| 4.20 | 978.3 | 985.9 | 993.4 | 1001 | 1009 | 1016 | 1024 | 1032 | 1039 | 1047 | 76.70 | |
| 4.30 | 1055 | 1063 | 1071 | 1079 | 1087 | 1094 | 1102 | 1110 | 1119 | 1127 | 80.00 | |
| 4.40 | 1135 | 1143 | 1151 | 1159 | 1167 | 1176 | 1184 | 1192 | 1200 | 1209 | 82.00 | |
| 4.50 | 1217 | 1226 | 1234 | 1243 | 1251 | 1260 | 1268 | 1277 | 1285 | 1294 | 86.00 | |
| 4.60 | 1303 | 1311 | 1320 | 1329 | 1338 | 1346 | 1355 | 1364 | 1373 | 1382 | 88.00 | |
| 4.70 | 1391 | 1400 | 1409 | 1418 | 1427 | 1436 | 1445 | 1455 | 1464 | 1473 | 91.00 | |
| 4.80 | 1482 | 1491 | 1501 | 1510 | 1519 | 1529 | 1538 | 1548 | 1557 | 1567 | 94.00 | |
| 4.90 | 1576 | 1586 | 1595 | 1605 | 1615 | 1624 | 1634 | 1644 | 1654 | 1663 | 97.00 | |
| 5.00 | 1673 | 1683 | 1693 | 1703 | 1713 | 1723 | 1733 | 1743 | 1753 | 1763 | 100.0 | |
| 5.10 | 1773 | 1783 | 1794 | 1804 | 1814 | 1824 | 1835 | 1845 | 1855 | 1866 | 103.0 | |
| 5.20 | 1876 | 1886 | 1897 | 1907 | 1918 | 1929 | 1939 | 1950 | 1960 | 1971 | 106.0 | |
| 5.30 | 1982 | 1992 | 2003 | 2014 | 2025 | 2036 | 2047 | 2057 | 2068 | 2079 | 108.0 | |
| 5.40 | 2090 | 2101 | 2112 | 2124 | 2135 | 2146 | 2157 | 2168 | 2179 | 2191 | 112.0 | |
| 5.50 | 2202 | 2213 | 2225 | 2236 | 2247 | 2259 | 2270 | 2282 | 2293 | 2305 | 114.0 | |
| 5.60 | 2316 | 2328 | 2340 | 2351 | 2363 | 2375 | 2386 | 2398 | 2410 | 2422 | 118.0 | |
| 5.70 | 2434 | 2445 | 2457 | 2469 | 2481 | 2493 | 2505 | 2517 | 2530 | 2542 | 120.0 | |
| 5.80 | 2554 | 2566 | 2578 | 2590 | 2603 | 2615 | 2627 | 2640 | 2652 | 2664 | 123.0 | |
| 5.90 | 2677 | 2689 | 2702 | 2714 | 2727 | 2740 | 2752 | 2765 | 2777 | 2790 | 126.0 | |
| 6.00 | 2803 | 2816 | 2828 | 2841 | 2854 | 2867 | 2880 | 2893 | 2906 | 2919 | 129.0 | |
| 6.10 | 2932 | 2945 | 2958 | 2971 | 2984 | 2997 | 3011 | 3024 | 3037 | 3050 | 132.0 | |
| 6.20 | 3064 | 3077 | 3090 | 3104 | 3117 | 3131 | 3144 | 3158 | 3171 | 3185 | 134.0 | |
| 6.30 | 3198 | 3212 | 3226 | 3239 | 3253 | 3267 | 3281 | 3294 | 3308 | 3322 | 138.0 | |
| 6.40 | 3336 | 3350 | 3364 | 3378 | 3392 | 3406 | 3420 | 3434 | 3448 | 3462 | 140.0 | |

